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Parasite donor age (years)

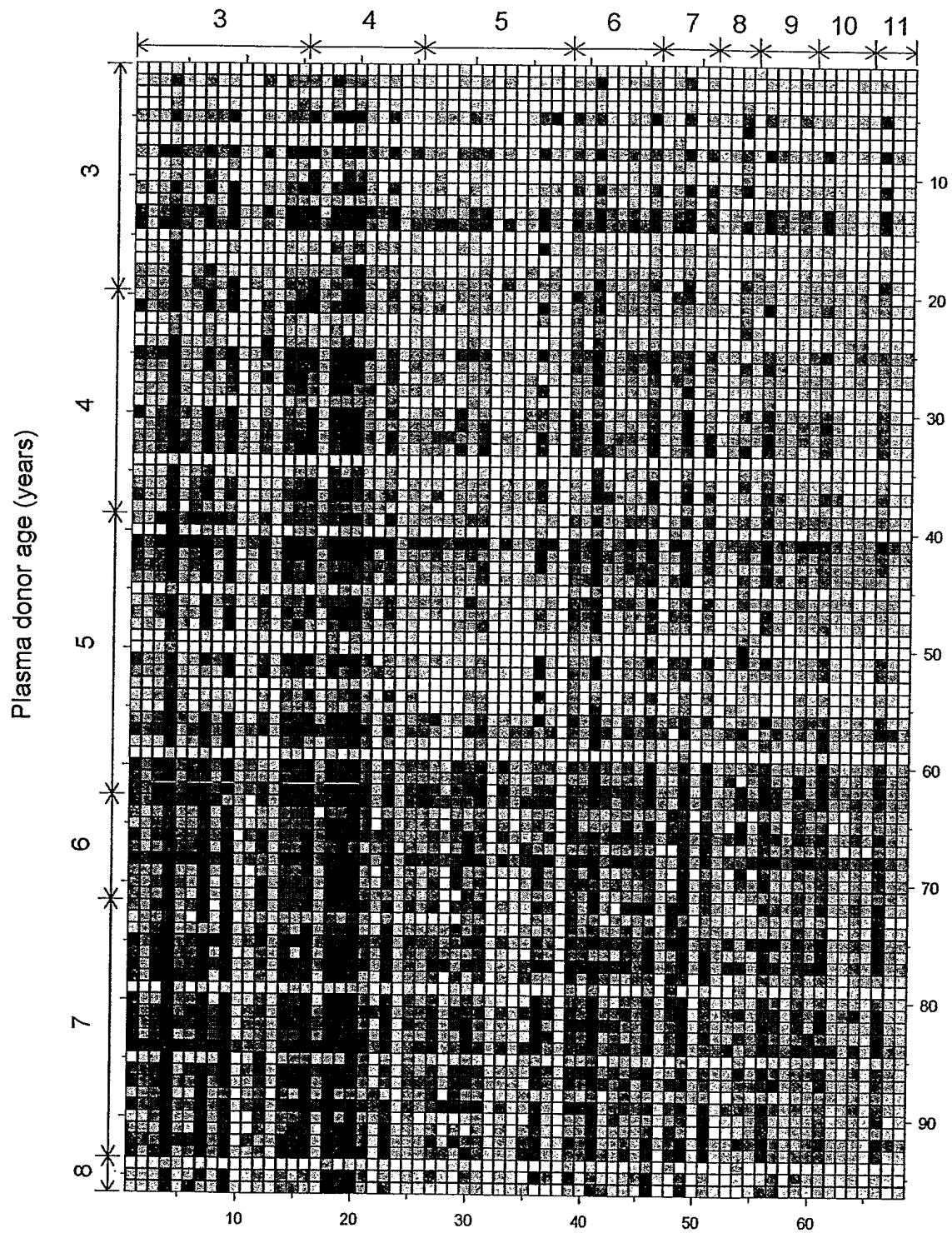


Fig. 1

SUBSTITUTE SHEET (RULE 26)

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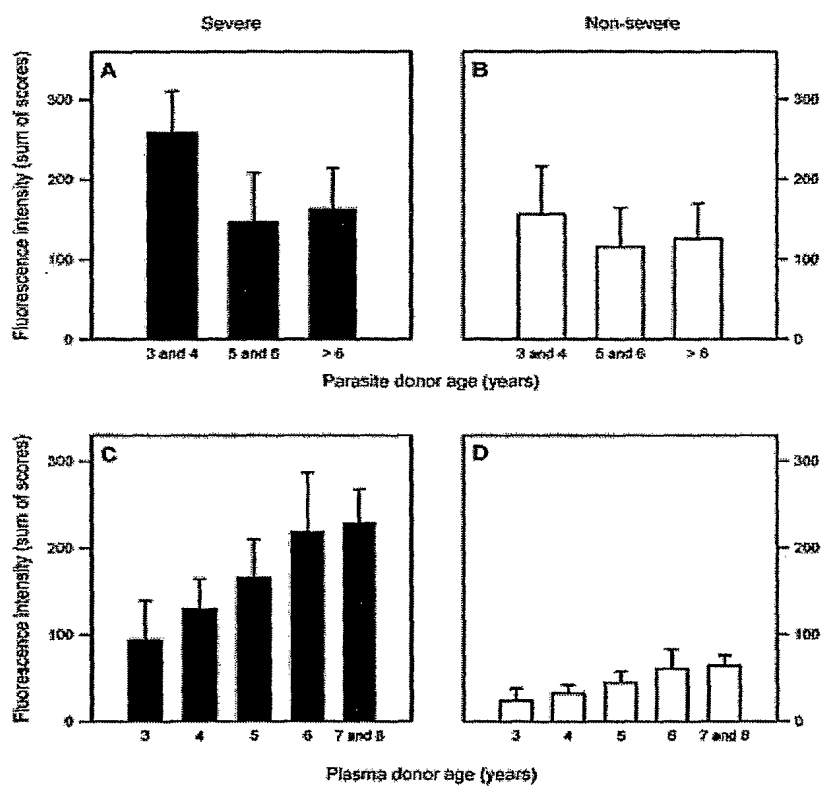
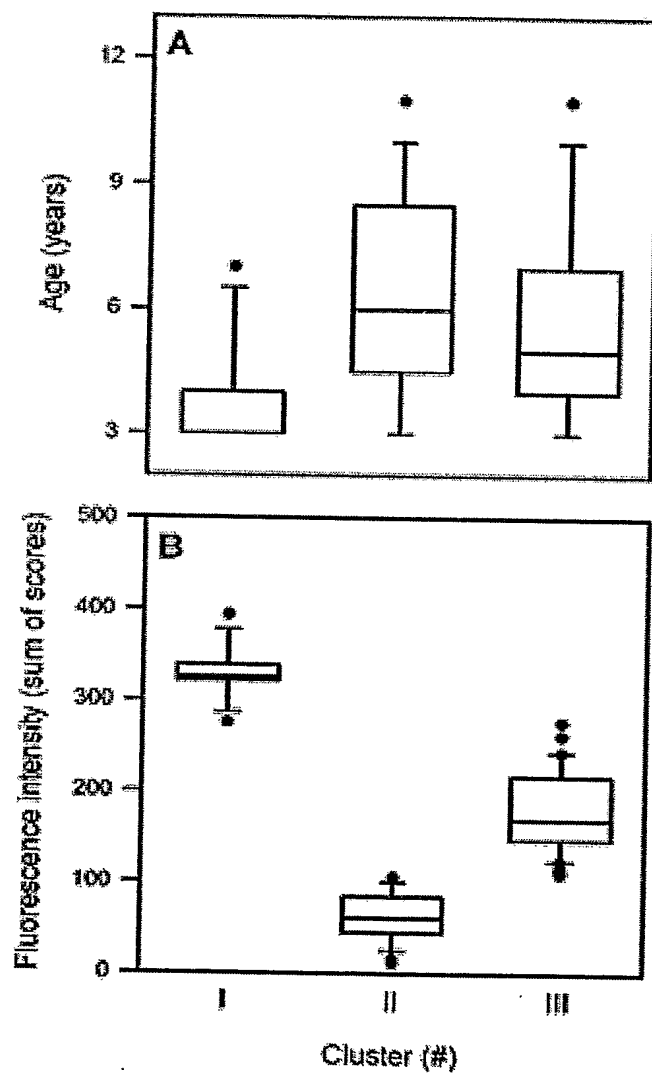


Fig. 2

3/25**Fig. 3**

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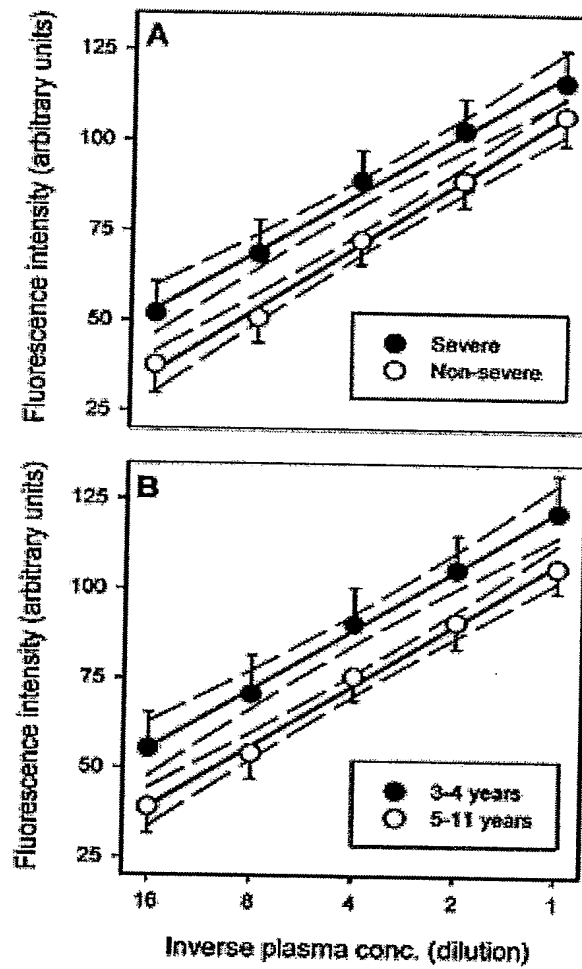


Fig. 4

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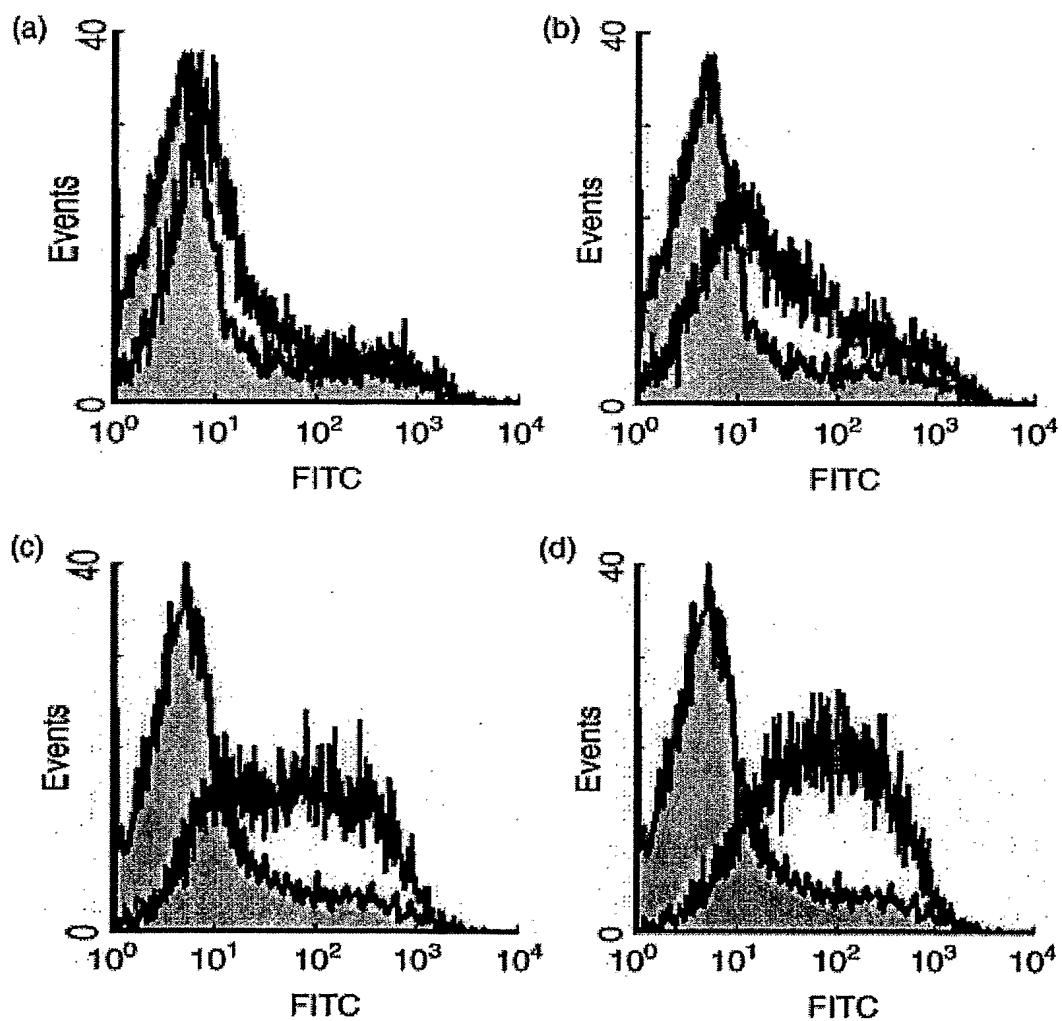


Fig. 5

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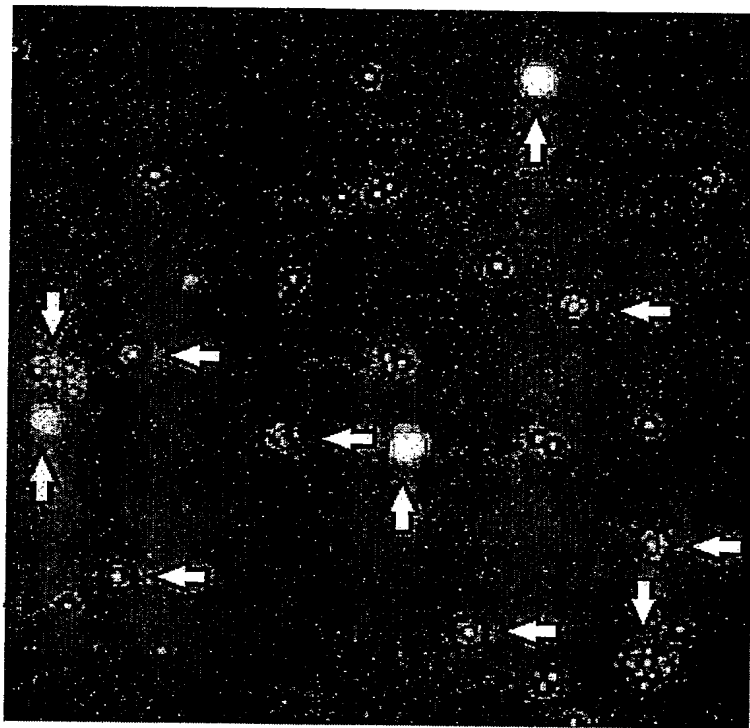


Fig. 6

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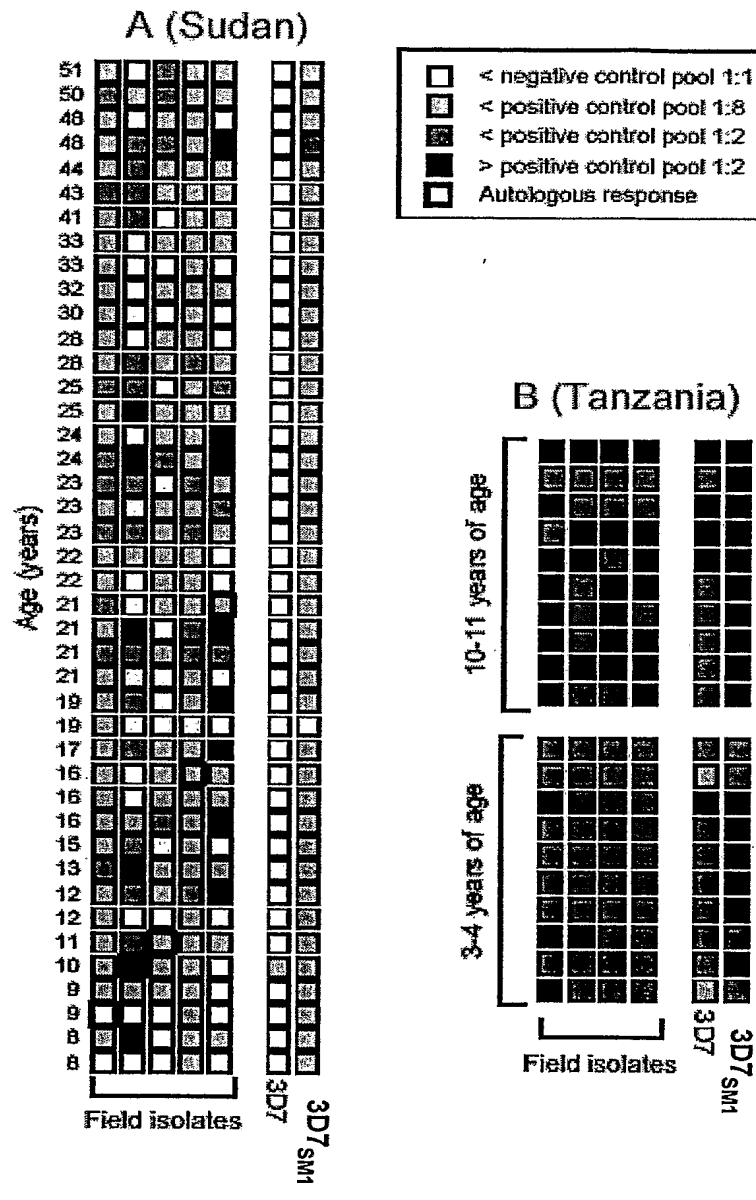
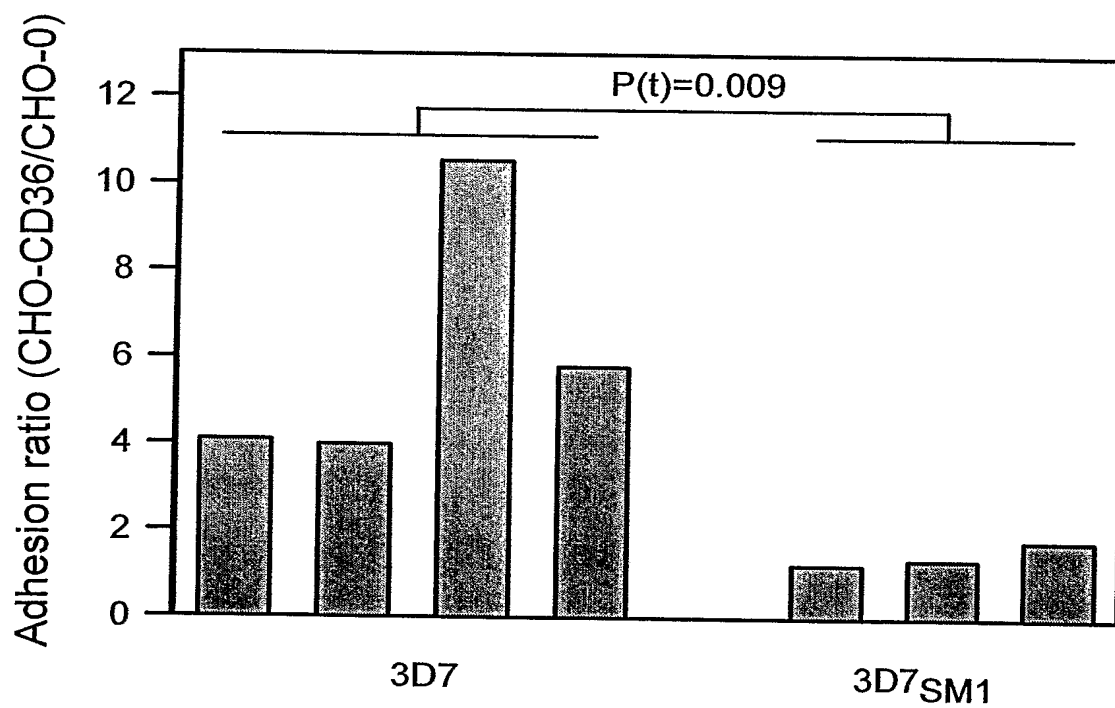


Fig. 7

8/25**Fig. 8**

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var1

var2

var group A

var group B/A

Gene	Location	Orientation (transcribed towards)	DBL1-			Domain structure												
			5' region	CIDR1	Intron	ATS	3' region	DBL1- α	CIDR1- α	DBL2- β	C2	DBL3- β	DBL4- γ	DBL5- γ	DBL6- β	DBL7- ϵ ...		
PFE1640W**	Telomeric	Telomere	upsD	A	None	None	None	None	DBL1- α	CIDR1- α	DBL2- β	C2	DBL3- β	DBL4- γ	DBL5- γ	DBL6- β	DBL7- ϵ ...	
PFL0030c	Near telomere	Telomere	upsE	None	AI	D	X	X	DBL1- α	DBL2- β	DBL3- β	DBL4- γ	DBL5- γ	DBL6- β	DBL7- ϵ	DBL8- β	DBL9- β	
PFD1235W	Near telomere	Telomere	upsA	A	AI	A	A	A	DBL1- α	CIDR1- α	DBL2- β	C2	DBL3- β	C2	DBL4- γ	DBL5- γ	DBL6- β	DBL7- ϵ
MAL7P1.1	Telomeric	Telomere	upsA	A	AI	A	A	A	DBL1- α	CIDR1- α	DBL2- β	C2	DBL3- β	C2	DBL4- γ	DBL5- γ	DBL6- β	DBL7- ϵ
PF11_0521	Telomeric	Telomere	upsA	A	AI	A	A	A	DBL1- α	CIDR1- α	DBL2- β	C2	DBL3- β	C2	DBL4- γ	DBL5- γ	DBL6- β	DBL7- ϵ
PF13_0003	Near telomere	Telomere	upsA	A	AI	A	A	A	DBL1- α	CIDR1- α	DBL2- β	C2	DBL3- β	C2	DBL4- γ	DBL5- γ	DBL6- β	DBL7- ϵ
PF08_0141	Near telomere	Telomere	upsA	A	X	A	A	A	DBL1- α	CIDR1- α	DBL2- β	C2	DBL3- β	C2	DBL4- γ	DBL5- γ	DBL6- β	DBL7- ϵ
PF11_0008	Near telomere	Telomere	upsA	A	X	A	A	A	DBL1- α	CIDR1- α	DBL2- β	C2	DBL3- β	C2	DBL4- γ	DBL5- γ	DBL6- β	DBL7- ϵ
PFD0020c	Near telomere	Telomere	upsA	A	X	A	A	A	DBL1- α	CIDR1- α	DBL2- β	C2	DBL3- β	C2	DBL4- γ	DBL5- γ	DBL6- β	DBL7- ϵ
PFA0015c	Near telomere	Telomere	upsA	A*	AI	A	A	A	DBL1- α	DBL2- ϵ	ATS							
MAL6P1.314	Near telomere	Telomere	upsA	A*	AI	A	A	A	DBL1- α	DBL2- ϵ	ATS							
PF1820W	Near telomere	Telomere	upsA	A*	AI	A	A	A	DBL1- α	DBL2- ϵ	ATS							
PF08_0140	Near telomere	Centromere	upsBsh	A	B	B	B	B	DBL1- α	CIDR1- α	DBL2- β	C2	DBL3- β	DBL4- γ	DBL5- γ	DBL6- β	DBL7- ϵ	
MAL6P1.316	Near telomere	Centromere	upsBsh ¹	A	X	X	X	X	DBL1- α	CIDR1- α	DBL2- β	C2	DBL3- β	DBL4- γ	DBL5- γ	DBL6- β	DBL7- ϵ	
PFL0020w	Near telomere	Centromere	upsBsh	X	X	X	B	B	DBL1- α	CIDR1- α	DBL2- β	C2	DBL3- β	DBL4- γ	DBL5- γ	DBL6- β	DBL7- ϵ	
MAL6P1.4	Telomeric	Centromere	upsB	C	X	X	B	B	DBL1- α	CIDR1- α	DBL2- β	C2	DBL3- β	DBL4- γ	DBL5- γ	DBL6- β	DBL7- ϵ	
PF11_0007	Telomeric	Centromere	upsB	X	B	B	D	D	DBL1- α	CIDR1- α	DBL2- β	C2	DBL3- β	DBL4- γ	DBL5- γ	DBL6- β	DBL7- ϵ	
PF08_0142	Telomeric	Centromere	upsB	B	B	B	D	D	DBL1- α	CIDR1- α	DBL2- β	C2	DBL3- β	DBL4- γ	DBL5- γ	DBL6- β	DBL7- ϵ	
PFE0005W	Telomeric	Centromere	upsB	B	B	B	D	D	DBL1- α	CIDR1- α	DBL2- β	C2	DBL3- β	DBL4- γ	DBL5- γ	DBL6- β	DBL7- ϵ	
PFA0005W	Telomeric	Centromere	upsB	B	B	C	B	B	DBL1- α	CIDR1- α	DBL2- β	C2	DBL3- β	DBL4- γ	DBL5- γ	DBL6- β	DBL7- ϵ	
PFA0765c	Telomeric	Centromere	upsB	B	B	B	B	B	DBL1- α	CIDR1- α	DBL2- β	C2	DBL3- β	DBL4- γ	DBL5- γ	DBL6- β	DBL7- ϵ	
PFC1120c	Telomeric	Centromere	upsB	B	B	B	B	B	DBL1- α	CIDR1- α	DBL2- β	C2	DBL3- β	DBL4- γ	DBL5- γ	DBL6- β	DBL7- ϵ	
PFD0005W	Telomeric	Centromere	upsB	B	B	B	B	B	DBL1- α	CIDR1- α	DBL2- β	C2	DBL3- β	DBL4- γ	DBL5- γ	DBL6- β	DBL7- ϵ	
PF0005W	Telomeric	Centromere	upsB	D	B	B	B	B	DBL1- α	CIDR1- α	DBL2- β	C2	DBL3- β	DBL4- γ	DBL5- γ	DBL6- β	DBL7- ϵ	
PF13_0364	Telomeric	Centromere	upsB	D	B	B	B	B	DBL1- α	CIDR1- α	DBL2- β	C2	DBL3- β	DBL4- γ	DBL5- γ	DBL6- β	DBL7- ϵ	
PF07_0139	Telomeric	Centromere	upsB	D	X	B	B	B	DBL1- α	CIDR1- α	DBL2- β	C2	DBL3- β	DBL4- γ	DBL5- γ	DBL6- β	DBL7- ϵ	
PFB1055c	Telomeric	Centromere	upsB	D	X	B	B	B	DBL1- α	CIDR1- α	DBL2- β	C2	DBL3- β	DBL4- γ	DBL5- γ	DBL6- β	DBL7- ϵ	

Fig. 9

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var group B									
PF10_0406	Telomeric	Centromere	upsB	B	X	B	B	DBL1- α	CIDR1- α
PF10005W	Telomeric	Centromere	upsB	B	X	B	B	DBL1- α	CIDR1- α
PF00010W	Telomeric	Centromere	upsB	B	X	B	B	DBL1- α	CIDR1- α
PF00005W	Telomeric	Centromere	upsB	B	X	B	B	DBL1- α	CIDR1- α
PF12665c	Telomeric	Centromere	upsB	B	X	B	B	DBL1- α	CIDR1- α
PF13_0001	Telomeric	Centromere	upsB	B	X	B	B	DBL1- α	CIDR1- α
MAL6P1.1	Telomeric	Centromere	upsB	E	B	B	B	DBL1- α	CIDR1- α
PF01245c	Telomeric	Centromere	upsB	X	X	C	B	DBL1- α	CIDR1- α
PF11830c	Telomeric	Centromere	upsB	C	X	B	B	DBL1- α	CIDR1- α
PF10_0001	Telomeric	Centromere	upsB	C	X	B	B	DBL1- α	CIDR1- α
PF10935c	Centromeric	Telomere	upsB	D	X	C	B	DBL1- α	CIDR1- α
PF00635c	Centromeric	Telomere	upsB	C	X	C	C	DBL1- α	CIDR1- α
PF11955W	Centromeric	Telomere	upsB	C	B	C	C	DBL1- α	CIDR1- α
PF08_0106	Centromeric	Telomere	upsB	C	B	C	X	DBL1- α	CIDR1- α
MAL7P1.50	Centromeric	Telomere	upsB	C	X	C	X	DBL1- α	CIDR1- α
PF08_0103	Centromeric	Telomere	upsB	B	X	C	X	DBL1- α	CIDR1- α
MAL7P1.55	Centromeric	Telomere	upsB	B	X	C	C	DBL1- α	CIDR1- α
PF07_0050	Centromeric	Telomere	upsB	B	A	B	D	DBL1- α	CIDR1- α
PF01005c	Centromeric	Telomere	upsB	E	B	B	C	DBL1- α	CIDR1- α
PF11950W	Centromeric	Telomere	upsB	E	X	B	D	DBL1- α	CIDR1- α
MAL6P1.252	Centromeric	Telomere	upsB	B	B	D	X	DBL1- α	CIDR1- α
PF00995c	Centromeric	Telomere	upsB	C	X	D	X	DBL1- α	CIDR1- α
MAL7P1.56	Centromeric	Telomere	upsB	C	X	B	D	DBL1- α	CIDR1- α
PF08_0107	Centromeric	Telomere	upsB	X	B	B	D	DBL1- α	CIDR1- α
PF07_0049	Centromeric	Telomere	upsB	C	B	C	X	DBL1- α	CIDR1- α
PF00630c	Centromeric	Telomere	upsB	C	B	C	C	DBL1- α	CIDR1- α
PF01000c	Centromeric	Telomere	upsB	C	B	B	C	DBL1- α	CIDR1- α
PF01015c	Centromeric	Telomere	upsB	D	B	B	X	DBL1- α	CIDR1- α
PF00615c	Centromeric	Telomere	upsB	C	X	X	X	DBL1- α	CIDR1- α
PF07_0051	Centromeric	Telomere	upsB	C	A	D	X	DBL1- α	CIDR1- α
PF07_0048	Centromeric	Telomere	upsB	C	X	C	C	DBL1- α	CIDR1- α
PF11960W	Centromeric	Telomere	upsB	C	X	C	X	DBL1- α	CIDR1- α
PF00625c	Centromeric	Telomere	upsB	C	X	C	X	DBL1- α	CIDR1- α

Fig. 9 continued a

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B	3D7 gene with closest related 5' sequence				DBL1- 5' region CIDR1 Intron ATS 3' region				Known domain structure						
	Strain	sequence	5' region	CIDR1	Intron	ATS	3' region								
PEMP1															
var1 family	3D7 homologue: PFE1640w								Both 5' region and coding sequences are conserved [42]						
var2 family	3D7 homologue: PFL0030c								Both 5' region and coding sequences are conserved [35]						
AAA75397	FOR3	MAL6P1.316	upsBsh ^a	A	nd.	C	D	DBL1- α	CIDR1- α	DBL2- β	C2	DBL3- γ	DBL4- δ	CIDR- β	ATS
AAA75396	Dd2	PF07_0050	upsB	C	nd.	B	X	DBL1- α	CIDR1- α	DBL2- β	C2	DBL3- γ	DBL4- δ	CIDR- β	ATS
AAA75398	FOR3	PF07_0139	upsB	E	nd.	B	X	DBL1- α	CIDR1 α	DBL2- β	C2	DBL3- δ	CIDR- β	ATS	
AAD03351	It	PFL2665c	upsB	X	nd.	nd.	nd.	DBL1- α	CIDR1- α	DBL2- β	C2	DBL3- δ	CIDR- β	DBL4- γ	DBL5- β
AF193424	It	PF08_0142	upsB	X	nd.	nd.	nd.	DBL1- α	CIDR1- α	DBL2- β	C2	DBL3- γ			
AAB60251	MC	-	nd.	B	nd.	B	D	DBL1- α	CIDR1- α	DBL2- δ	CIDR- γ	DBL3- β	DBL4- ϵ	ATS	
AAC05220	-	PFD0005w	upsB	B	nd.	nd.	nd.	DBL1- α	CIDR1 α	DBL2- β	C2	DBL3- δ			
AAC47438	FCR3	PFB1055c	upsB	X	nd.	B	nd.	DBL1- α	CIDR1 α	DBL2- β	C2	DBL3- δ	CIDR- β	ATS	
AAB06961	It	PFL0020w	upsBsh	X	nd.	nd.	nd.	DBL1- α	CIDR1- α	DBL2- β	C2	DBL3- δ	CIDR- β		
AAA75399	Dd2	PFD1015c	upsC	B	nd.	C	X	DBL1- α	CIDR1- α	DBL2- δ	CIDR- β	ATS			
AAC05730	FCR3	-	nd.	C	nd.	C	nd.	DBL1- α	CIDR1- α	DBL2- δ	CIDR- β	ATS			

Fig. 9 continued b

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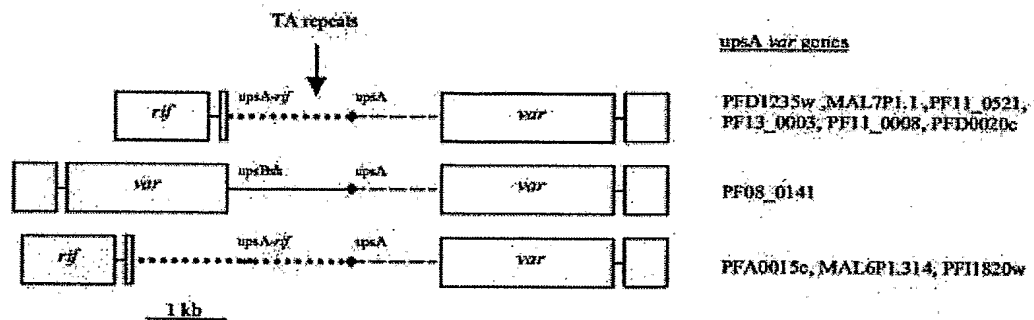


Fig. 10

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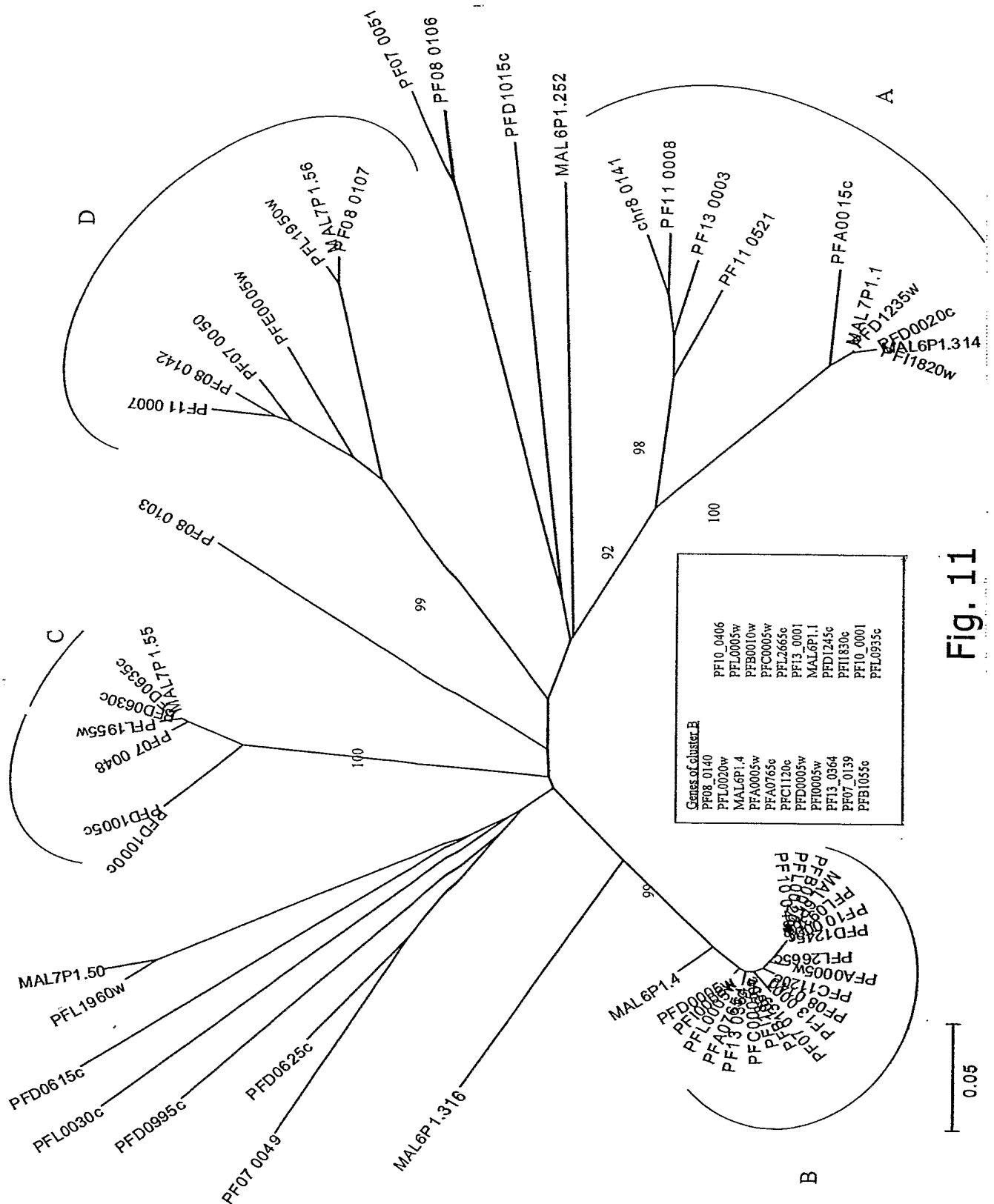
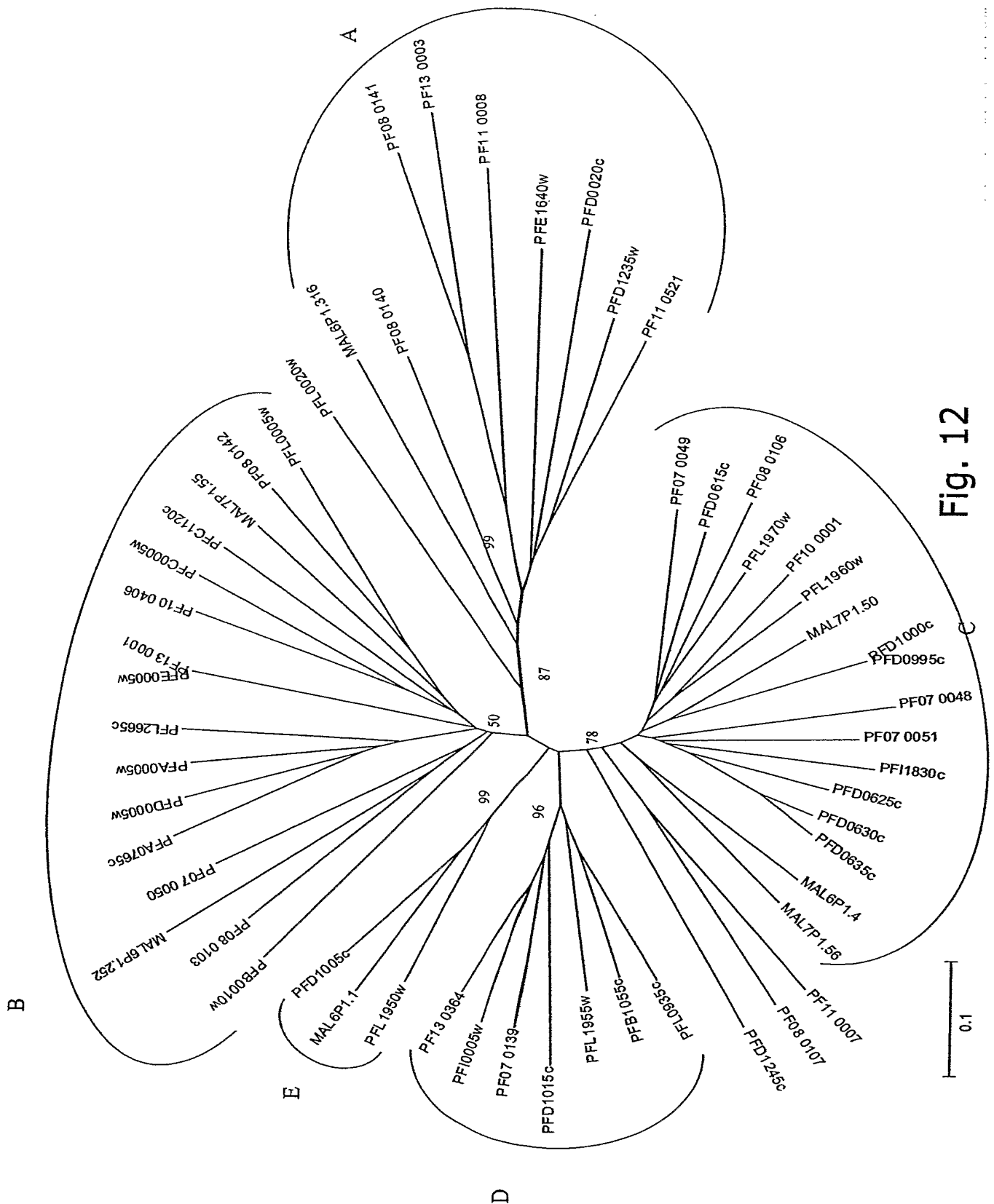


Fig. 11

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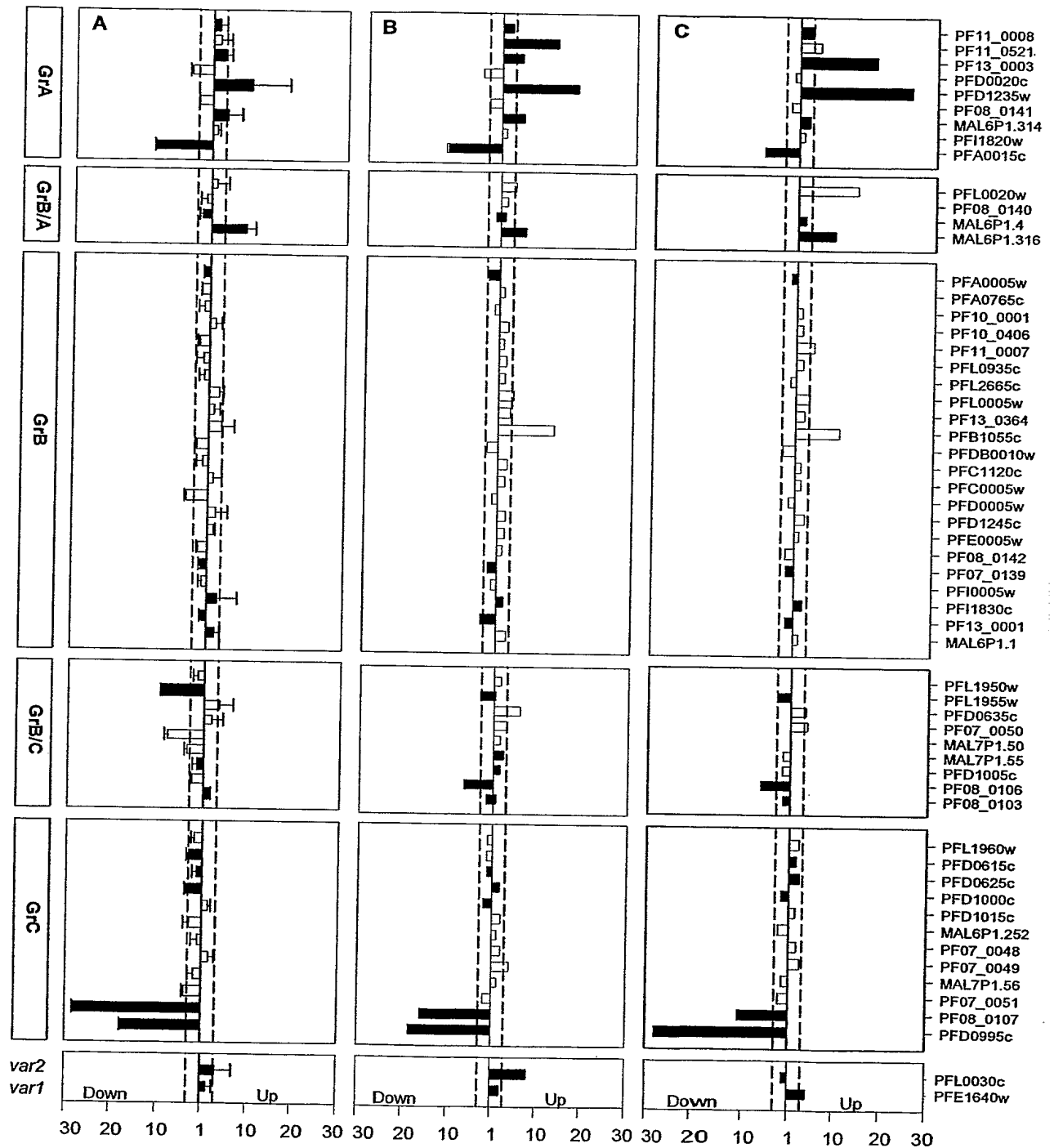


Fig. 13

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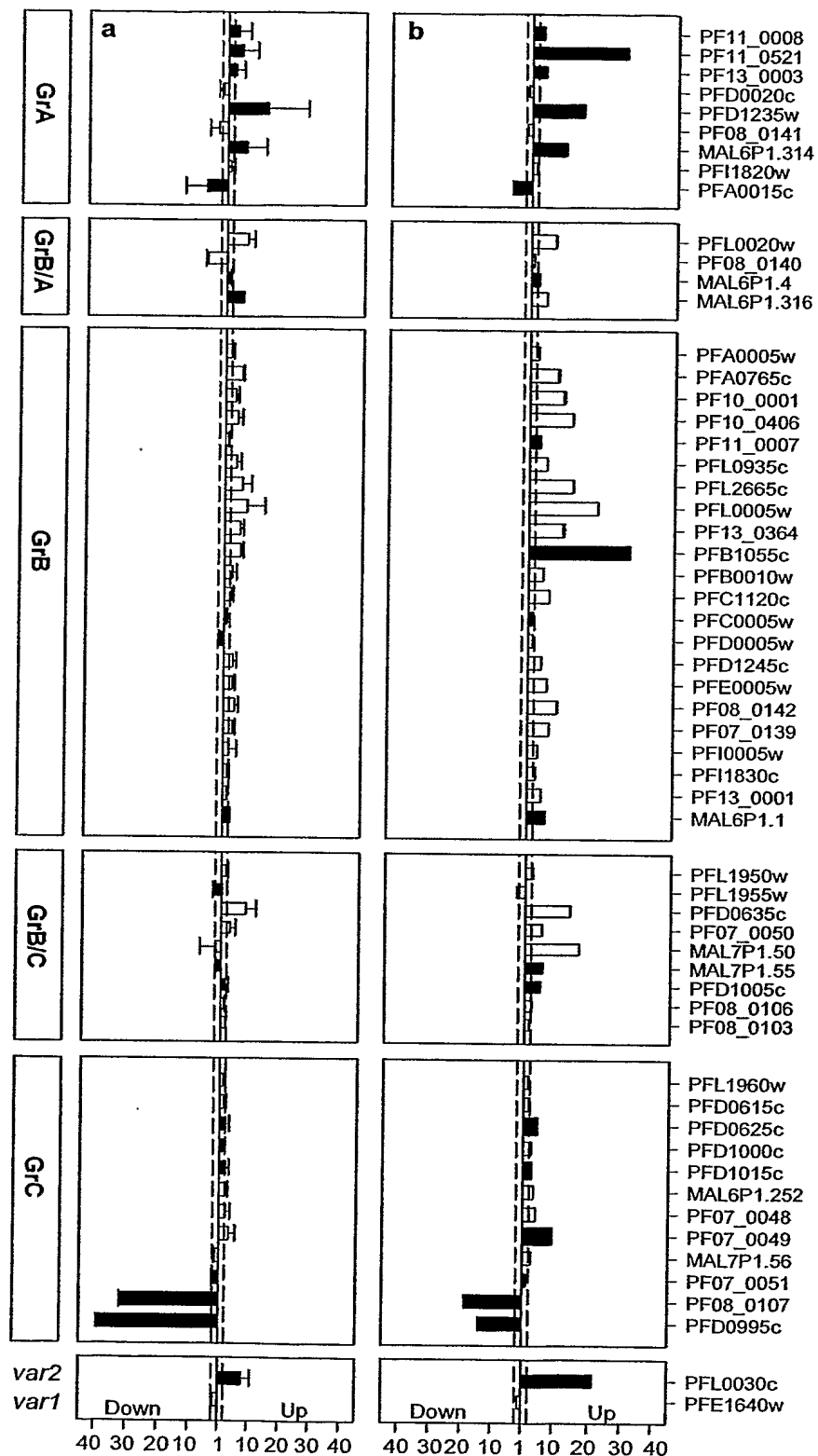
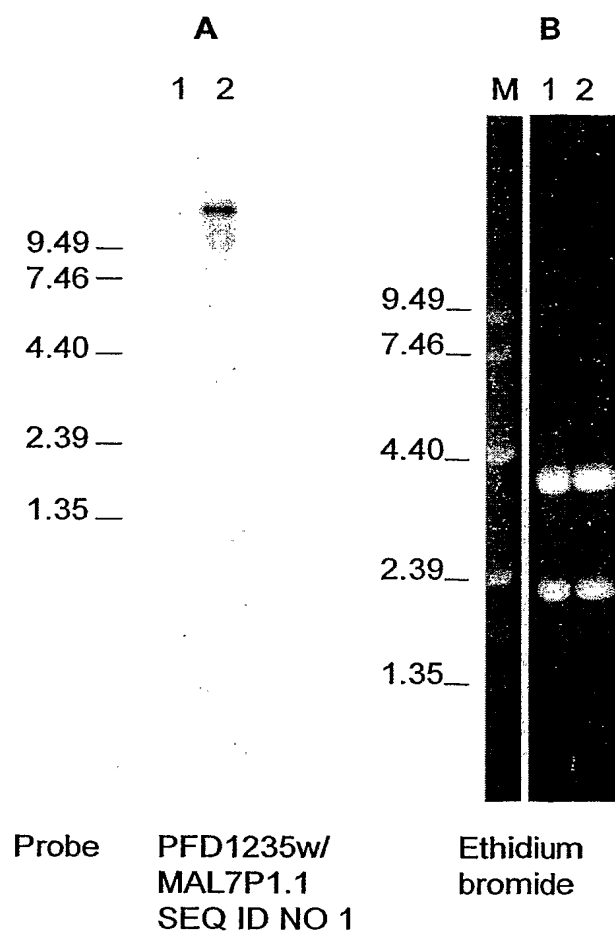


Fig. 14

17/25**Fig. 15**

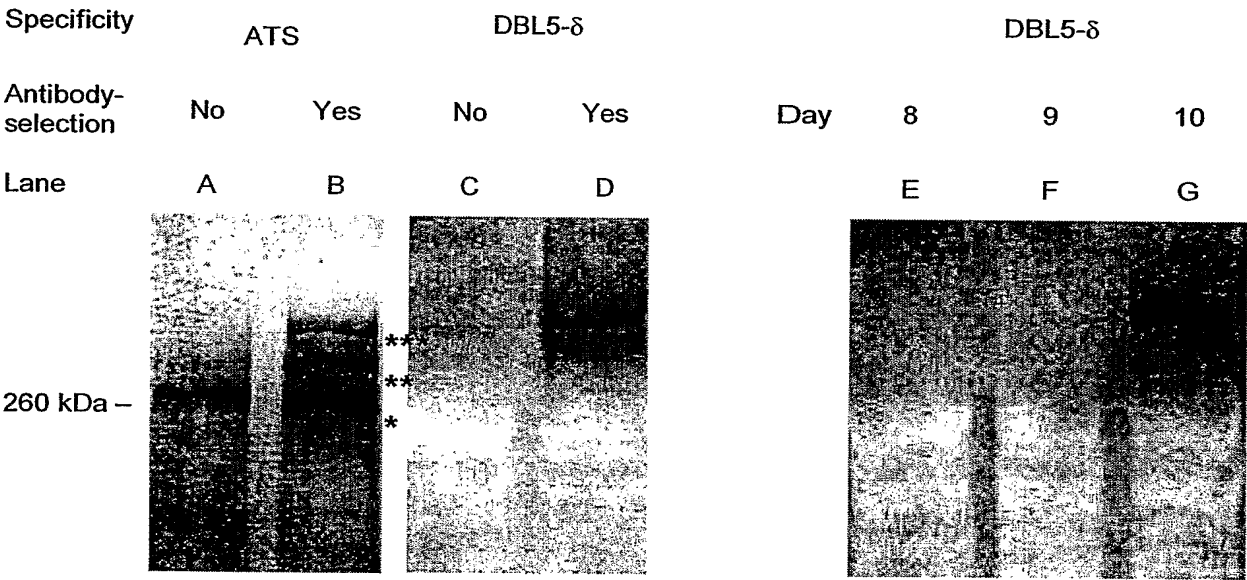


Fig. 16

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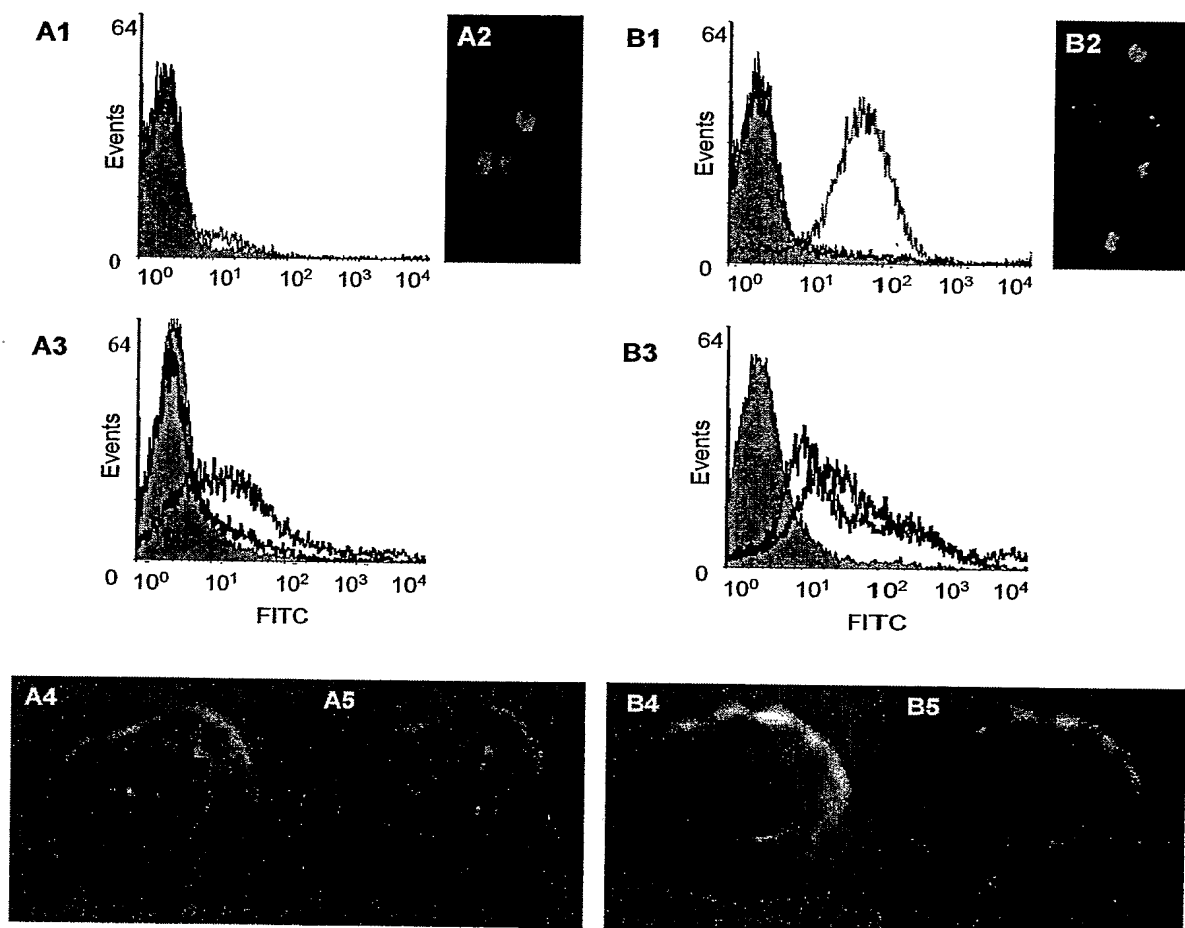


Fig. 17

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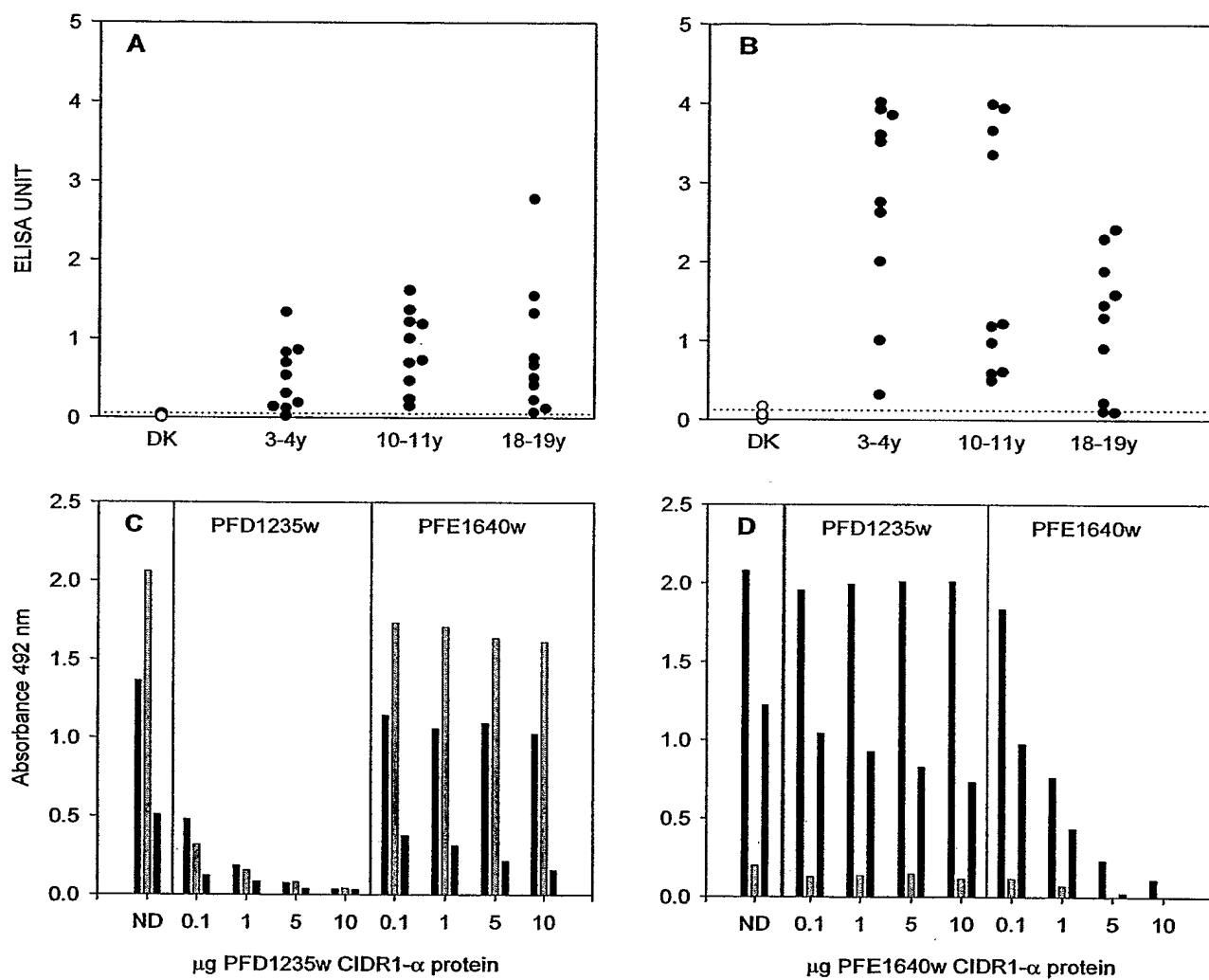


Fig. 18

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*      20      *      40      *      60      *      80
BM021/1-76 : VVHNAEDRNPCLFSRseRFSNEGEAECSgdkIrdNge4sagGACAPYRRRyICDYNLHHINENNIRNTHDLLGN6LVMA4 : 81
BM048/1-76 : VVHNAEDRNPCLFSRseRFSNEGEAECSgdkIrdNge4sagGACAPYRRRyICDYNLHHINENNIRNTHDLLGN6LVMA4 : 81
PFD1235w/1 : VVHNAEDRNPCLFSRseRFSNEGEAECSgdkIrdNge4sagGACAPYRRRyICDYNLHHINENNIRNTHDLLGN6LVMA4 : 79

*      100      *      120      *      140      *      160
BM021/1-76 : FEESIVKSHSEYTGIGYKSGGCTSLARSFADIGDIRGNDLYLGINGMDRLNKLEIFKNIIDE TSTATRG KEALQA : 162
BM048/1-76 : FEESIVKSHSEYTGIGYKSGGCTSLARSFADIGDIRGNDLYLGINGMDRLNKLEIFKNIIDE TSTATRG KEALQA : 162
PFD1235w/1 : FEESIVKSHSEYTGIGYKSGGCTSLARSFADIGDIRGNDLYLGINGMDRLNKLEIFKNIIDE TSTATRG KEALQA : 157
SEGESIVKSHSEYTGIGYKSGGCTSLARSFADIGDIRGNDLYLGINGMDRLNKLEIFKNIIDE TSTATRG KEALQA : 157

*      180      *      200      *      220      *      240
BM021/1-76 : RYQHDAF-YYQLREDWTAAPHNTWKALTCASAPRDAQYFIKSSVRDQTFSDNYCGHGEHEVLNLDYVPQFLRWFEESSE : 242
BM048/1-76 : RYQHDAF-YYQLREDWTAAPHNTWKALTCASAPRDAQYFIKSSVRDQTFSDNYCGHGEHEVLNLDYVPQFLRWFEESSE : 242
PFD1235w/1 : RYQHDAF-YYQLREDWTAAPHNTWKALTCASAPRDAQYFIKSSVRDQTFSDNYCGHGEHEVLNLDYVPQFLRWFEESSE : 238
RYQHDAF-YYQLREDWTAAPHNTWKALTCASAPRDAQYFIKSSVRDQTFSDNYCGHGEHEVLNLDYVPQFLRWFEESSE : 238

*      260      *      280      *      300      *      320
BM021/1-76 : EFCRIKKIKLKNVVKACRDD3KaLYCgrNGYDCTKTnRN enLprgsKCTnCwaKcN6YEsWLnNqQeEfKQKQKeKyeKEI : 322
BM048/1-76 : EFCRIKKIKLKNVVKACRDD3KaLYCgrNGYDCTKTnRN enLprgsKCTnCwaKcN6YEsWLnNqQeEfKQKQKeKyeKEI : 322
PFD1235w/1 : EFCRIKKIKLKNVVKACRDD3KaLYCgrNGYDCTKTnRN enLprgsKCTnCwaKcN6YEsWLnNqQeEfKQKQKeKyeKEI : 319

*      340      *      360      *      380      *      400
BM021/1-76 : LKKNNEKISGSHINNKYEDFKELEKKCANNNHKLNEGKYNKKEKEE EMDFTNI EGTFRSKCEVCFE : 401
BM048/1-76 : LKKNNEKISGSHINNKYEDFKELEKKCANNNHKLNEGKYNKKEKEE EMDFTNI EGTFRSKCEVCFE : 401
PFD1235w/1 : LKKNNEKISGSHINNKYEDFKELEKKCANNNHKLNEGKYNKKEKEE EMDFTNI EGTFRSKCEVCFE : 398
LkYkSneki3gSNINNKYYedFYkeLekk cannlnf6KLLNEG4YcnKKEKEE EMDFTNI EGTFRSKCEVCFE : 398

*      420      *      440      *      460      *      480
BM021/1-76 : CGV2CrnTCTPKKekyPNCeInEaYiPpkDatpiDI3VLY3GDE2GDItkKLseFCs1eN4ENgENY2iWQCYKKnSDIN : 482
BM048/1-76 : CGV2CrnTCTPKKekyPNCeInEaYiPpkDatpiDI3VLY3GDE2GDItkKLseFCs1eN4ENgENY2iWQCYKKnSDIN : 482
PFD1235w/1 : CGV2CrnTCTPKKekyPNCeInEaYiPpkDatpiDI3VLY3GDE2GDItkKLseFCs1eN4ENgENY2iWQCYKKnSDIN : 478

*      500      *      520      *      540      *      560
BM021/1-76 : KCKMTPSSHKVPKHGYIMSF5AFFDLWVKNLLID3INWKNELTNCINNNTNVTDCNDCNTNCKCFENWAKTKENEWKKVKT : 563
BM048/1-76 : KCKMTPSSHKVPKHGYIMSF5AFFDLWVKNLLID3INWKNELTNCINNNTNVTDCNDCNTNCKCFENWAKTKENEWKKVKT : 563
PFD1235w/1 : KCKMTPSSHKVPKHGYIMSF5AFFDLWVKNLLID3INWKNELTNCINNNTNVTDCNDCNTNCKCFENWAKTKENEWKKVKT : 559

*      580      *      600      *      620      *      640
BM021/1-76 : IYKNENGNTNNYKKNL11FkGYFFHVMKE6NKEaKwNKLME1LKEKIDSSNLKNGTKDSEGAIKVLFdHLKDIAERCIDN : 644
BM048/1-76 : IYKNENGNTNNYKKNL11FkGYFFHVMKE6NKEaKwNKLME1LKEKIDSSNLKNGTKDSEGAIKVLFdHLKDIAERCIDN : 644
PFD1235w/1 : IYKNENGNTNNYKKNL11FkGYFFHVMKE6NKEaKwNKLME1LKEKIDSSNLKNGTKDSEGAIKVLFdHLKDIAERCIDN : 640

*      660      *      680      *      700      *      720
BM021/1-76 : NSNeSCdvSkD3KTNPcsetrGSKPTKSVKQLAEHMQQKAQKLLGTRGGESnLKGDAIRGTYNLGGQGNLTNGDICKITKN : 725
BM048/1-76 : NSNeSCdvSkD3KTNPcsetrGSKPTKSVKQLAEHMQQKAQKLLGTRGGESnLKGDAIRGTYNLGGQGNLTNGDICKITKN : 725
PFD1235w/1 : NSNeSCdvSkD3KTNPcsetrGSKPTKSVKQLAEHMQQKAQKLLGTRGGESnLKGDAIRGTYNLGGQGNLTNGDICKITKN : 721

*      740      *      760
BM021/1-76 : ITNDSRNGEPCGTGKDKYNGFRLNIGTPTWNIQAKKK : 764
BM048/1-76 : ITNDSRNGEPCGTGKDKYNGFRLNIGTPTWNIQAKKK : 764
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Fig. 19

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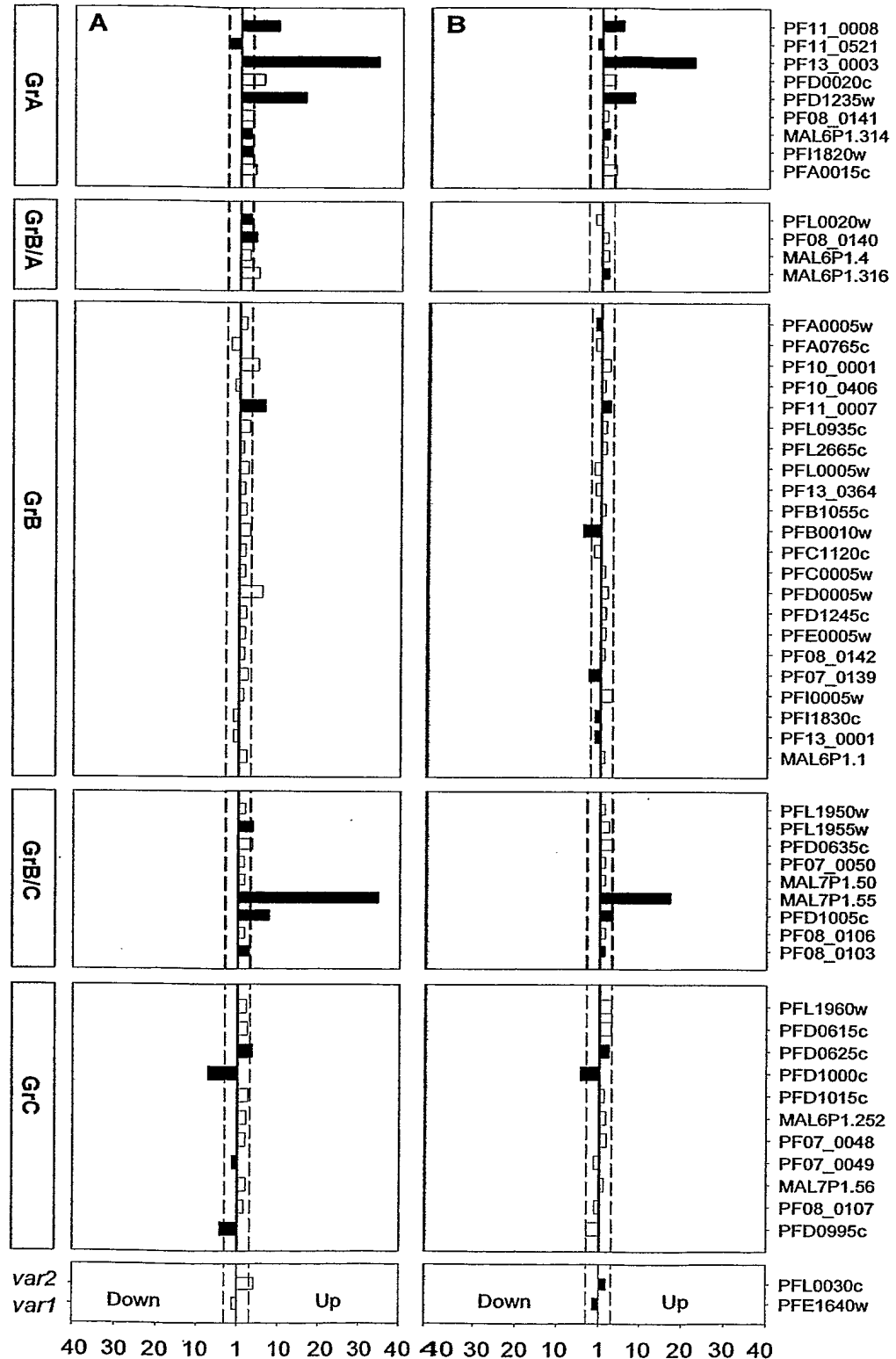


Fig. 20

SUBSTITUTE SHEET (RULE 26)

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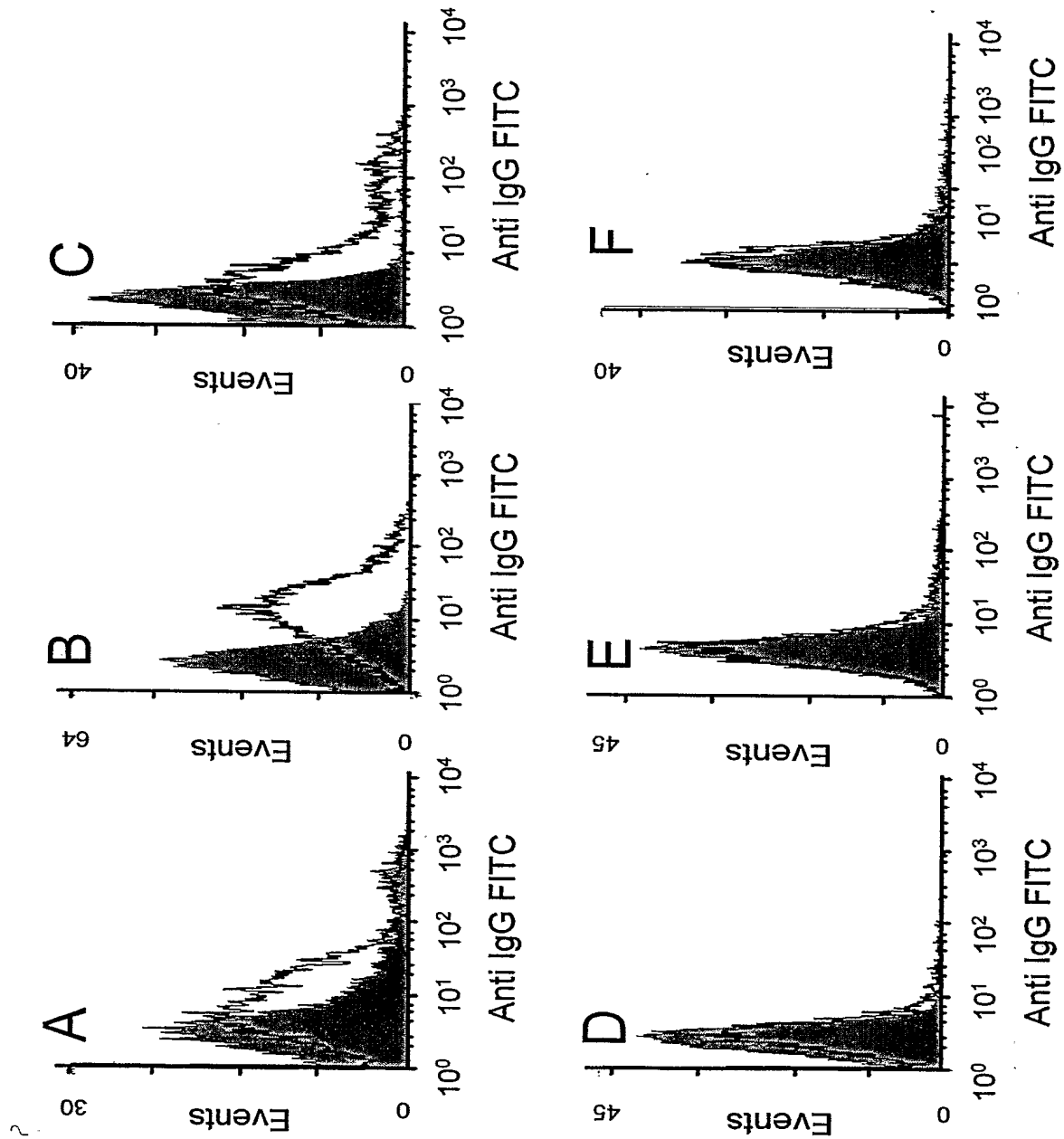


Fig. 21

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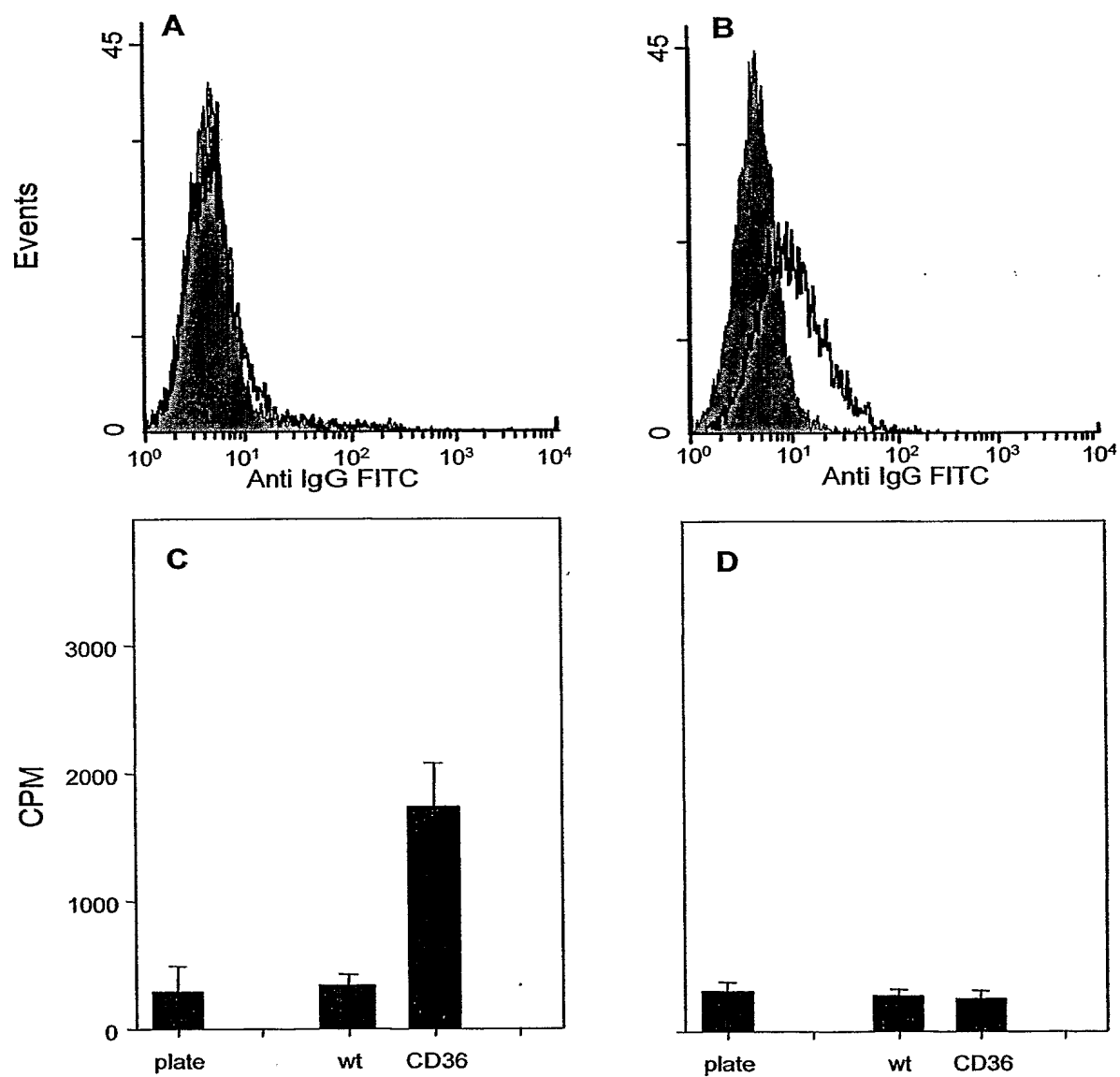


Fig. 22

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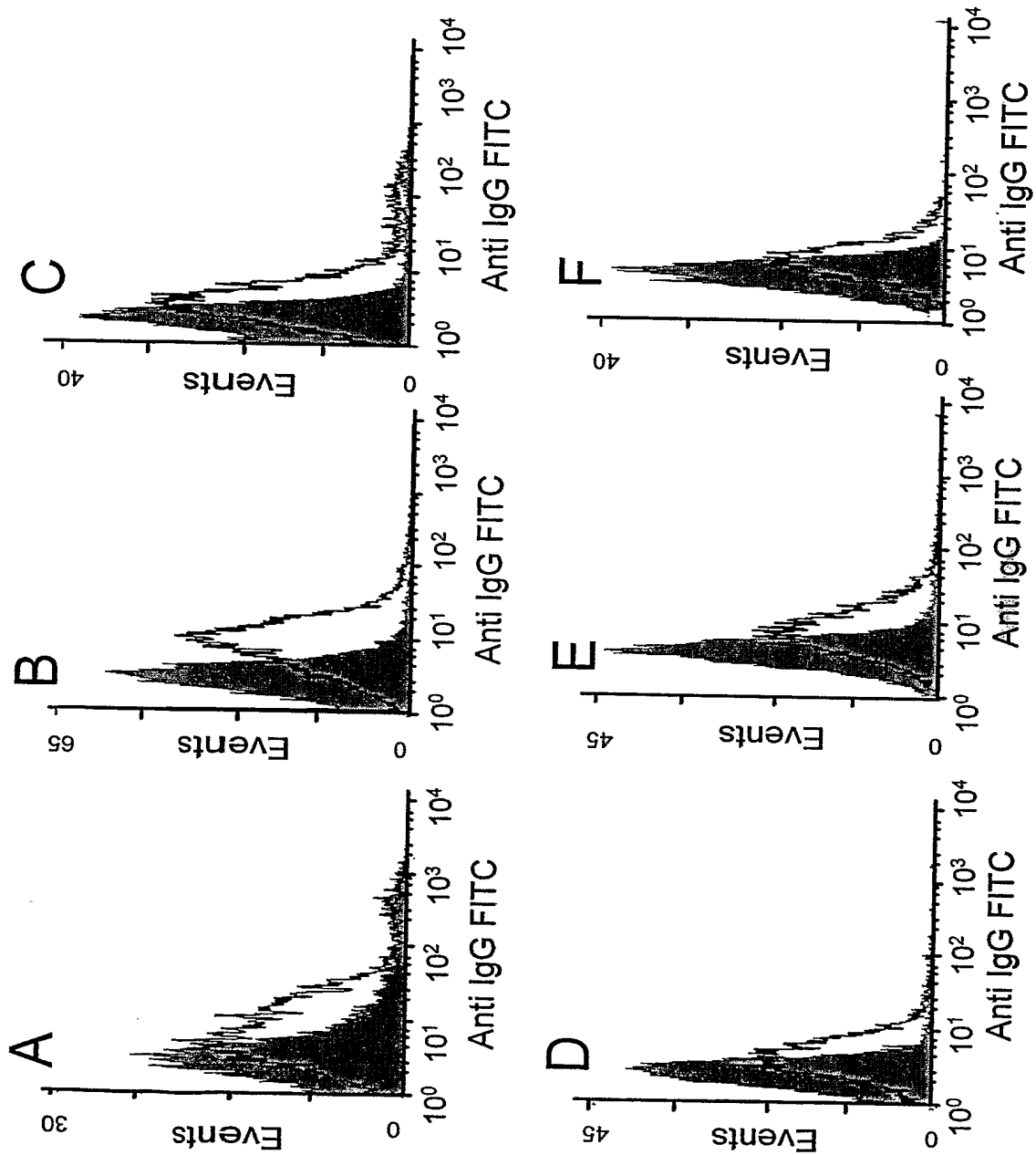


Fig. 23